DOCUMENT RESUME

ED 095 420 CE 001 989

TITLE	Drafting--Basic, Drafting--Intermediate: 9255.01.
INSTITUTION	Dade County Public Schools, Miami, Fla.
PUB DATE	Dec 72
NOTE	20p.; An Authorized Course of Instruction for the Quinmester Program
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS	Behavioral Objectives; Course Content; Course Descriptions; *Curriculum Guides; *Drafting; *Graphic Arts; Industrial Arts; Secondary Grades; Shop Curriculum; Technical Education; *Trade and Industrial Education; *Vocational Education
IDENTIFIERS	Lettering; *Quinmester Program

ABSTRACT

The course has no prerequisites, offers instruction in basic drafting room techniques and procedures, and also covers job opportunities and industrial methods in engineering. The student is introduced to and asked to perform fundamental drafting problems with working drawings, using multiview and auxiliary views and sections. The course also covers drafting paper, alphabet of lines, title block, notes, bill-of-material, and lettering. The student will solve and draw problems in aeronautical drafting. Requiring 135 clock hours, the course is divided into five time blocks: (1) orientation--6 hours, (2) introduction to drafting--18 hours, (3) lettering--21 hours, (4) working drawings (multiview)--88 hours, and (5) Quinmester posttest. (Author/MW)

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AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

V-8

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Course Outline
DRAFTING - INTERMEDIATE - 9255
(Drafting - Basic)
Department 45, 48 - Quin 9255.01

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DADE COUNTY PUBLIC SCHOOLS
DIVISION OF INSTRUCTION • 1973

D A D E C O U N T Y P U B L I C S C H O O L S

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Course Outline

DRAFTING - INTERMEDIATE - 9255
(Drafting - Basic)

Department 45, 48 - Quin 9255.01

county office of

VOCATIONAL AND ADULT EDUCATION

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Dr. E. L. Whigham, Superintendent of Schools
Dade County Public Schools
Miami, Florida 33132

December, 1972

Published by the School Board of Dade County

Course Description

9255	45, 48	9255.01	Drafting - Basic
State Category Number	County Dept. Number	County Course Number	Course Title

This is a basic course in drafting room techniques and procedures. The course covers job opportunities and industrial methods in engineering. The student will be introduced to and perform fundamental drafting problems with working drawings, using multiview and auxiliary views and sections. The course will also cover drafting paper, alphabet of lines, title block, notes, bill-of-material and lettering. The student will solve and draw problems in aeronautical drafting.

Clock Hours: 135

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PREFACE

The following course outline is presented as an introduction to vocational drafting. It is intended that this course will orientate the student in the duties, responsibilities, and career opportunities of the drafting profession. It also introduces the learner to the various types of tools and equipment used in the trade and provides him or her an opportunity for instruction and practice in their use.

This course is taught in a two-hour block for 90 hours or a three-hour block for 135 hours. In each instance the course consists of five instructional blocks which are subdivided into several units each.

In presenting the material outlined in this course, the instructor uses audiovisual equipment and materials.

There are no prerequisites for this course.

This outline was developed through the cooperative efforts of the instructional and supervisory personnel, the Quinmester Advisory Committee, and the Vocational Curriculum Materials Service, and has been approved by the Dade County Vocational Curriculum Committee.

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GOALS

The student must be able to demonstrate:

1. The ability to conduct himself in an office situation and know the responsibilities that are expected of him.

2. Skills in the selection and handling of tools and equipment through organized practice sessions.

3. The ability to letter and print in the fashion that is required in industry and to the specific task at hand.

4. The knowledge to construct drawings that could be used in an office situation.

5. The use of tools and equipment to perform a task in a predetermined length of time and to the satisfaction of a drawing checker.

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BLOCK I - ORIENTATION

The student must be able to:

1. Demonstrate an understanding of classroom procedure as though he worked in a drafting room.
2. Determine proper safety habits and conduct himself, at all times, according to the code of an engineering atmosphere.
3. Demonstrate an understanding of the requirements for on-the-job training and higher education available to the student after graduation.

BLOCK II - INTRODUCTION TO DRAFTING

The student must be able to:

1. Demonstrate the use of the tools and equipment used in the industry.
2. Perform tasks assigned with the piece of equipment that is necessary to complete the task.
3. Demonstrate an understanding of the various types of drawing paper used in the industry.
4. Use such types of drawing paper and know why various types of paper are used.
5. Exhibit the ability to pick the proper size drawing sheet for the particular task and know what the various sizes of drawing paper are called.
6. Explain the various types of lines that are used on engineering or shop drawings and become familiar with the standard used throughout the industry.
7. Construct title blocks containing important specific information needed to construct the drawing and the part.
8. Print the notes in the proper location on the drawing and use the standard method of explaining the information pertaining to the particular drawing.
9. Erect a bill of material for every drawing he builds and provides information in that bill of material which is compatible with the thoughts and reasons why the drawing is being built.

BLOCK III - LETTERING

The student must be able to:

1. Exhibit the ability to letter in several ways and become quite proficient in the standard type of lettering used in the industry.
2. Letter all information and specifications on the drawing and understand that the most important part of the drawn plan is to communicate thoughts to the shop or field.
3. Perform assigned tasks with mechanical lettering devices used by some fields in the industry.

BLOCK IV - WORKING DRAWINGS - MULTIVIEW

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The student must be able to:

1. Draw an object or part (mechanical), that is pictured in isometric or oblique, in three views, using the method explained.
2. Determine the placement of views and draw auxiliary views if necessary.
3. Construct dimensions of various types on the drawings that the student is drawing.
4. Prepare the drawings with the proper dimensions in the right locations with accuracy and using the standard type arrowheads.
5. Draw detail drawings and know why and what the drawing will be used for and who will use the drawing.
6. Perform assigned tasks through many hours of laboratory experiences to become very proficient.
7. Exhibit the ability to sketch objects or parts that are given to him and place the proper dimensions on the drawing that he is constructing.
8. Sketch field problems and place the proper information on the sketch to produce the finished product in the office at the drawing board.
9. Draw all the various types of section views and views needed to produce drawings that are used in the industry.
10. Use these sections and views to his best advantage and know the proper location and reasons why the section is used.

BLOCK V - QUINMESTER POST-TEST

The student must be able to:

1. Satisfactorily complete the quinmester post-test.

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Course Outline

DRAFTING - INTERMEDIATE - 9255
(Drafting - Basic)

Department 45, 48 - Quin 9255.01

I. ORIENTATION

A. Acquainting the Student With the Classroom Procedure
   1. Bulletin boards
      a. Job opportunities
      b. Industrial methods
   2. School rules
      a. Discipline
      b. Counselors
      c. Drafting supplies
      d. Fees
      e. Textbooks
      f. Hours
         (1) Breaks
         (2) Make-up time
         (3) Certificate
             (a) Importance
             (b) Industry
   3. Safety rules
      a. General
      b. Later in course

B. Objectives of Course
   1. Discussion of course objectives
      a. Training
         (1) Industry oriented
         (2) Modern methods
      b. On-the-job
         (1) Requirements
         (2) Advantages
      c. Higher education
         (1) Engineering
         (2) Design
   2. Benefits derived by student
      a. Work
         (1) During school
         (2) After graduation
      b. Prerequisite
         (1) College
         (2) Design school
   3. Teaching methods used by instructor
      a. Lecture with models
      b. Slides
   4. Procedures to be followed by students
      a. Complete all work assigned
      b. Obey office rules
      c. Strive to work part-time

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II. INTRODUCTION TO DRAFTING

A. Drafting Tools
   1. Pencil
      a. Types
      b. Grades
      c. Sharpening
      d. Use of
   2. Straight edge, drafting machine, T-square
      a. Types
      b. Parts
      c. Use of
   3. Triangles
      a. Types
      b. Angles of each in combination
      c. Use of
   4. French curves, protractors, templates
      a. Types
      b. Use of
   5. Erasers
      a. Types
      b. Use of
   6. Scales
      a. Architect
      b. Engineer
      c. Machine
      d. Flat
      e. Triangle
      f. Metal
   7. Tape
      a. Types
      b. Use of
   8. Erasing shield
      a. Use of
      b. Types
   9. Compass
      a. Types
      b. Use of

B. Drafting Paper
   1. Types
      a. Tracing
      b. Cloth
      c. Mylar
   2. Use of each

C. Standard Sheet
   1. Size
      a. Industry standard
      b. Reasons
   2. Type

D. Alphabet of Lines
   1. Value
      a. Visible outline

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b. Hidden outline
c. Center line
d. Extension line
e. Dimension line
f. Cutting plane line
g. Section line
h. Phantom line
i. Short break line
j. Long break line
k. Guide lines

2. Use of

E. Title Block
1. Types
a. Architectural
b. Machine and electronic
2. Use of
a. Information necessary
b. Location

F. Notes
1. Use of
a. Industry standard
b. Reason
2. Location
3. Order

G. Bill of Material
1. Use of
a. Industry standard
b. Reason
2. Location

III. LETTERING

A. Vertical
1. Exercising stroke direction
2. Spacing
3. Method
4. Size
5. Practice

B. Mechanical Lettering
1. Types
a. Leroy
b. Wrico
c. Template
2. Template

IV. WORKING DRAWINGS - MULTIVIEW

A. Three-View Projection
   1. 45° Method
   2. Arrangement of views
   3. Selection of views
      a. Auxiliary views
      b. Placement of views

B. Dimensioning
   1. Types
      a. Decimal
      b. Fractional
   2. Location
   3. Scale
      a. Accuracy
      b. Correct form
   4. Arrowheads

C. Drawings - Detail
   1. Use of
   2. Practice

D. Sketching
   1. Use of
   2. Practice

E. Sections
   1. Types
      a. Full
      b. Half
      c. Broken-out
      d. Rotated
      e. Removed
      f. Auxiliary
      g. Assembly
   2. Definition

V. QUINMESTER POST-TEST

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APPENDIX

QUINMESTER POST-TEST SAMPLE

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Quinmester Post-Test

Name _____ Date _____ Score _____

True-False Test Items

Each of the following statements is either true or false. If the statement is true, draw a circle around the letter T following it; if the statement is false, draw a circle around the F. If a statement is false in part it is entirely false.

1. Draftsmen with a wide knowledge of all types of drafting will benefit in the future. T F

2. Discipline in an office situation is really not too important for productive engineering. T F

3. Testbooks are used as reference material that is used in industry. T F

4. It is necessary to achieve higher education in order to work as a draftsman in an office. T F

5. Drafting certificates are received at the end of the senior year by anyone who has completed the course with passing grades. T F

6. Money received for drawing in an office is very substantial and that is the only reason why students accept positions like this. T F

7. Safety habits are very important in drafting positions because the work drawn on paper reflects safe conditions in the field or shop. T F

8. Vocational counseling is available in the classroom as well as the counselor's office. T F

9. Clean work habits are very important. T F

10. Job opportunities are good if the student is willing to try very hard to work. T F

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Multiple Choice Test Items

Each statement needs a word, a figure or a phrase to make it correct. Only one of the choices listed is correct. Place the letter of the choice you make in the space provided at the left.

___ 1. The title block of a standard drawing should be located in:

a. Upper right corner
b. Any available corner
c. Top center
d. Lower right corner
e. Upper left corner
f. None of the above

___ 2. The "French Curve" is a drafting tool that is used to:

a. Draw irregular lines
b. Construct Ellipses
c. Lay out isometric circles
d. Connect a series of irregular points
e. Construct radii
f. None of the above

___ 3. A "draftsman's point" is always used in drawing because it:

a. Makes a better line
b. Insures uniform touch
c. Breaks when too much pressure is applied
d. Saves sharpening time
e. Leaves an indentation in the paper
f. None of the above

___ 4. Pencil grade charts from the very hard to the soft start with 9H and go to 7B. Where does the "F" grade lead fit into this chart:

a. Between HB and B
b. Between H and HB
c. Between HB and 2H
d. After the 7B
e. None of the above
f. All of the above

___ 5. Purpose of mechanical pencils:

a. Give a professional look
b. Lighter in weight
c. Better balance
d. Easier to sharpen
e. Heavier in weight
f. None of the above

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___ 6. Various types of erasers are used by draftsmen because:

a. Different drafting papers require it
b. Of the variety of pencils used
c. Of the preference of each individual
d. Results are unpredictable
e. The temperature of paper varies
f. None of the above

___ 7. Various grades of pencils are essential to good draftsmanship for the following reason:

a. Gives variety to drawing
b. Relieves monotony of drawing
c. Identifies line alphabet
d. Permits self-expression
e. Variety in paper use
f. None of the above

___ 8. Plastic triangles are used extensively for the following reason:

a. Light in weight
b. Drawing is visible through angle
c. Can be cleaned without warping
d. Material retains stability
e. Will not scratch
f. None of the above

___ 9. Which of the following tools do <u>not</u> pertain to drafting:

a. Scale
b. Protractor
c. T-square
d. Ruler
e. Lead holder
f. Slide rule

___10. There is one item listed below that should never be used as a straightedge:

a. Triangle
b. Parallel rule
c. Scale
d. T-square
e. Drafting machine
f. Straightedge

<u>Completion Test Items</u>

Fill in the blanks with the word or words that make the statement correct.

1. With several draftsmen working on the same drawing, what drafting aids would be used to keep lettering consistent? _____

2. Uniform height of lettering is accomplished by the use of _____.

3. A very popular type of mechanical lettering set is a _____.

4. Using his drawings as samples of work to show an employer, the student must show _____ lettering to secure the position.

5. Slant lettering is used by some firms in industry but _____ lettering is most common and should be practiced more frequently.

Performance Test

Each student will perform the assigned task at his own work station. He will have enough equipment to complete the task. There will be no talking and the student can leave his work station only to use the reference area. The assigned model or machine part will be placed on the student's drawing board.

The student will perform operation A and B in any order he desires.

Operation A

1. Sketch the model or part.
2. Use either isometric or oblique pictorial views.
3. Place necessary dimensions on drawing.
4. Specify material and make any remarks or give any information you think necessary to have the part manufactured.

Operation B

1. Show part in three views using the orthographic projection method.
2. Place dimensions where they will be used to the best advantage.
3. Use the standard title block and bill of material.
4. Specify all information necessary to have the part produced.

ANSWER KEY TO QUINMESTER POST-TEST

True-False Test Items	Multiple Choice Test Items
1. T	1. d
2. F	2. a
3. T	3. a
4. F	4. b
5. F	5. d
6. F	6. a
7. T	7. c
8. T	8. b
9. T	9. d
10. T	10. c

Completion Test Items

1. Lettering template or Leroy set
2. Guide lines
3. Leroy set
4. Excellent
5. Vertical

Performance Test

Check the sketch and drawing as the regular work is checked using the normal check list.

Suggested check list rates accuracy, lettering, dimensioning, neatness, instruction and line work.

Check for completeness.